

#5-



SEQUENCE LISTING

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<141> November 16, 1999

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 Trp Val Lys Ser Leu Leu Lys Glu Lys Leu Glu Met Leu Val Asp  
                  450                     455                     460  
  
 Pro Asp Leu Glu Asn Asn Tyr Ile Asp Thr Glu Val Glu Gln Leu Ile  
                  465                     470                     475                     480  
  
 Gln Val Ala Leu Leu Cys Thr Gln Gly Ser Pro Met Glu Arg Pro Lys  
                  485                     490                     495  
  
 Met Ser Glu Val Val Arg Met Leu Glu Gly Asp Gly Leu Ala Glu Lys  
                  500                     505                     510  
  
 Trp Asp Glu Trp Gln Lys Val Glu Val Ile His Gln Asp Val Glu Leu  
                  515                     520                     525  
  
 Ala Pro His Arg Thr Ser Glu Trp Ile Leu Asp Ser Thr Asp Asn Leu  
                  530                     535                     540  
  
 His Ala Phe Glu Leu Ser Gly Pro Arg  
                  545                     550

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<212> DNA  
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<210> 7  
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<210> 16
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<213> Daucus carota

<400> 17
Ser Pro Pro Pro Pro
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<210> 18
<211> 8
<212> PRT
<213> Daucus carota

<400> 18
His Arg Asp Val Lys Ala Ala Asn
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<210> 19
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<212> PRT
<213> Daucus carota

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<400> 19  
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 1 5

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 actcaaattg tatggcagt tttttttttt ttttaatga taagacaagt atctgtttaa 180  
 tggtattgtg atgaaacagt agtaaagtca ttcggcac gccatactac ttccacagtg 240  
 gaacctggcc aaattttgtc tttgccgtct ctacagttc ttccacccaa tttttgttg 300  
 acaaaaactca aatcttcaa tctcatctct gccaaagttg gtttagaaa gaatatcagc 360  
 aaacactaat atcttatttgc ttgcattgtt tatcaatcac aaaattcaca accattgtaa 420  
 aaaaaaaattc acattttgg tatgagattt ctcacatgtt agtgaacctc tttacattt 480  
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 gttttctac ttaaagaaaa aagggaccca acagagagag gtttgaccag gagaaacggg 600  
 tgcatagcct taagagctt caactacttt accccaaacc caaagcgatg tcacttcaa 660  
 ccatctcttc tctccccga acccggtttt ttgaccgtc agttcggca gcagcaccgt 720  
 tacggcagc ttatattcct cgtcttcctc ctctacacca ctgcattccc ataaataaag 780  
 cccgttgaga tctttaaaaa tattaaataa tatatcaacg aaaaagctat tttattcata 840  
 agaagaaaaa gagaggaaca acaacaacac actaatcata gtttctctgg caggcttgtt 900  
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 gtgtgtgtga gagagagagt gtggtttgat tgagggaaaaga cgacgacgag aacgccccgg 1080  
 aattaggatt ttttattttat ttttactct ttgtttgcgtt taatgctaattt gggttttaa 1140  
 aagggttattc gaaaaaatga gtgagtttgcgtt gttgaggttg tctctgtaaa gtgttaatgg 1200  
 tggtgattttt cgaaagtttag gttttctcg gatctgaaga gatcaaatca agattcgaaa 1260



aaacagaaga tggaaatcttt gcttctctgt caatccttt tctcatataa ctcatcttgc 2976  
caataaggca ataaccataat gatctaattt gatttcaggt gggtatggta taactggagc 3036  
aatagctggt ggagttgctg caggtgctgc tttgctctt gctgctcctg caatagccctt 3096  
tgcttggtgg cgacgaagaa agccactaga tattttcttc gatgtgcctg gtgagtttat 3156  
tattcgcatt agtttctgtt cttagccagc aattttgttt tgcagaaaaag tatttggaaaca 3216  
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cagagaggcc accgtcacaa cctccgcttg attggccaac gcggaaagaga atcgcgctag 3816  
gctcagctcg aggtttgtct tacctacatg atcactgcga tccgaagatc attcaccgtg 3876  
acgtaaaaagc agcaaacatc ctcttagacg aagaattcga agcgggtgtt ggagatttcg 3936  
ggttggcaaa gctaattggac tataaagaca ctcacgtgac aacagcagtc cgtggcacca 3996  
tcggtcacat cgctccagaa tatctctcaa ccggaaaatc ttcagagaaa accgacgttt 4056  
tcggataacgg aatcatgctt ctaga 4081

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<210> 21
<211> 494
<212> PRT
<213> Arabidopsis thaliana
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20 25 30

Leu His Thr Leu Arg Val Thr Leu Val Asp Pro Asn Asn Val Leu Gln  
35 40 45

Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp Phe His Val Thr  
       50                    55                    60

Cys Asn Asn Glu Asn Ser Val Ile Arg Val Asp Leu Gly Asn Ala Glu  
       65                    70                    75                    80

Leu Ser Gly His Leu Val Pro Glu Leu Gly Val Leu Lys Asn Leu Gln  
       85                    90                    95

Glu Leu Tyr Ser Asn Asn Ile Thr Gly Pro Ile Pro Ser Asn Leu Gly  
       100                   105                   110

Asn Leu Thr Asn Leu Val Ser Leu Asp Leu Tyr Leu Asn Ser Phe Ser  
       115                   120                   125

Gly Pro Ile Pro Glu Ser Leu Gly Lys Leu Ser Lys Leu Arg Phe Leu  
       130                   135                   140

Arg Leu Asn Asn Asn Ser Leu Thr Gly Ser Ile Pro Met Ser Leu Thr  
       145                   150                   155                   160

Asn Ile Thr Thr Leu Gln Val Leu Asp Leu Ser Asn Asn Arg Leu Ser  
       165                   170                   175

Gly Ser Val Pro Asp Asn Gly Ser Phe Ser Leu Phe Thr Pro Ile Ser  
       180                   185                   190

Phe Ala Asn Asn Leu Asp Leu Cys Gly Pro Val Thr Ser His Pro Cys  
       195                   200                   205

Pro Gly Ser Pro Pro Phe Ser Pro Pro Pro Pro Phe Ile Gln Pro Pro  
       210                   215                   220

Pro Val Ser Thr Pro Ser Gly Tyr Gly Ile Thr Gly Ala Ile Ala Gly  
       225                   230                   235                   240

Gly Val Ala Ala Gly Ala Ala Leu Leu Phe Ala Ala Pro Ala Ile Ala  
       245                   250                   255

Phe Ala Trp Trp Arg Arg Arg Lys Pro Leu Asp Ile Phe Phe Asp Val  
       260                   265                   270

Pro Ala Glu Glu Asp Pro Glu Val His Leu Gly Gln Leu Lys Arg Phe  
       275                   280                   285

Ser Leu Arg Glu Leu Gln Val Ala Ser Asp Gly Phe Ser Asn Lys Asn  
       290                   295                   300

Ile Leu Gly Arg Gly Gly Phe Gly Lys Val Tyr Lys Gly Arg Leu Ala  
       305                   310                   315                   320

Asp Gly Thr Leu Val Ala Val Lys Arg Leu Lys Glu Glu Arg Thr Pro  
       325                   330                   335

Gly Gly Glu Leu Gln Phe Gln Thr Glu Val Glu Met Ile Ser Met Ala  
       340                   345                   350

Val His Arg Asn Leu Leu Arg Leu Arg Gly Phe Cys Met Thr Pro Thr  
 355 360 365  
 Glu Arg Leu Leu Val Tyr Pro Tyr Met Ala Asn Gly Ser Val Ala Ser  
 370 375 380  
 Cys Leu Arg Glu Arg Pro Pro Ser Gln Pro Pro Leu Asp Trp Pro Thr  
 385 390 395 400  
 Arg Lys Arg Ile Ala Leu Gly Ser Ala Arg Gly Leu Ser Tyr Leu His  
 405 410 415  
 Asp His Cys Asp Pro Lys Ile Ile His Arg Asp Val Lys Ala Ala Asn  
 420 425 430  
 Ile Leu Leu Asp Glu Glu Phe Glu Ala Val Val Gly Asp Phe Gly Leu  
 435 440 445  
 Ala Lys Leu Met Asp Tyr Lys Asp Thr His Val Thr Thr Ala Val Arg  
 450 455 460  
 Gly Thr Ile Gly His Ile Ala Pro Glu Tyr Leu Ser Thr Gly Lys Ser  
 465 470 475 480  
 Ser Glu Lys Thr Asp Val Phe Gly Tyr Gly Ile Met Leu Leu  
 485 490

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 <222> (142)..(795)

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 cttaaacctc cgaaagctca c atg gcg tct cga aac tat cgg tgg gag ctc 171  
 Met Ala Ser Arg Asn Tyr Arg Trp Glu Leu  
 1 5 10

ttc gca gct tcg tta acc cta acc tta gct ttg att cac ctg gtc gaa 219  
 Phe Ala Ala Ser Leu Thr Leu Thr Ala Leu Ile His Leu Val Glu  
 15 20 25

gca aac tcc gaa gga gat gct ctc tac gct ctt cgc cgg agt ttg aca 267  
 Ala Asn Ser Glu Gly Asp Ala Leu Tyr Ala Leu Arg Arg Ser Leu Thr  
 30 35 40

gat cca gac cat gtc ctc cag agc tgg gat cca act ctt gtt aat cct 315  
 Asp Pro Asp His Val Leu Gln Ser Trp Asp Pro Thr Leu Val Asn Pro  
 45 50 55

tgt acc tgg ttc cat gtc acc tgt aac caa gac aac cgc gtc act cgt		363	
Cys Thr Trp Phe His Val Thr Cys Asn Gln Asp Asn Arg Val Thr Arg			
60	65	70	
gtg gat ttg gga aat tca aac ctc tct gga cat ctt gcg cct gag ctt		411	
Val Asp Leu Gly Asn Ser Asn Leu Ser Gly His Leu Ala Pro Glu Leu			
75	80	85	90
ggg aag ctt gaa cat tta cag tat cta gag ctc tac aaa aac aac atc		459	
Gly Lys Leu Glu His Leu Gln Tyr Leu Glu Leu Tyr Lys Asn Asn Ile			
95	100	105	
caa gga act ata cct tcc gaa ctt gga aat ctg aag aat ctc atc agc		507	
Gln Gly Thr Ile Pro Ser Glu Leu Gly Asn Leu Lys Asn Leu Ile Ser			
110	115	120	
ttg gat ctg tac aac aac aat ctt aca ggg ata gtt ccc act ttc ttg		555	
Leu Asp Leu Tyr Asn Asn Asn Leu Thr Gly Ile Val Pro Thr Phe Leu			
125	130	135	
gga aaa ttg aag tct ctg gtc ttt tta cgg ctt aat gac aac cga ttg		603	
Gly Lys Leu Lys Ser Leu Val Phe Leu Arg Leu Asn Asp Asn Arg Leu			
140	145	150	
acc ggt cca atc cta gag cac tca cgg caa tcc caa gcc ttt aaa gtt		651	
Thr Gly Pro Ile Leu Glu His Ser Arg Gln Ser Gln Ala Phe Lys Val			
155	160	165	170
gtt gac gtc tca agc aat gat ttg tgt ggg aca atc cca aca aac gga		699	
Val Asp Val Ser Ser Asn Asp Leu Cys Gly Thr Ile Pro Thr Asn Gly			
175	180	185	
ccc ttt gct cac att cct tta cag aac ttt gag aac aac ccg aga ttg		747	
Pro Phe Ala His Ile Pro Leu Gln Asn Phe Glu Asn Asn Pro Arg Leu			
190	195	200	
gag gga ccg gaa tta ctc ggt ctt gca agc tac gac act aac tgc acc		795	
Glu Gly Pro Glu Leu Leu Gly Leu Ala Ser Tyr Asp Thr Asn Cys Thr			
205	210	215	
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accactttat caaatatcac atctattatg taataagtat atatatgttag taaaaacaaa		915	
aaaaatgaag aatcgaatcg gtaatatcat ctggtctcaa ttgagaactt cgaggctgt		975	
atgtaaaatt tctaaatgctt atttcgctt actgttatgt tcgggtgtgg gattctgaga		1035	
agtaacattt gtattggat ggtatcaagt tttctgcct tgcgtcaaa aaaaaaaaaaa		1095	
aaaaaaaaaaa a		1106	

<210> 23  
<211> 218  
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<213> unknown

<400> 23

Met Ala Ser Arg Asn Tyr Arg Trp Glu Leu Phe Ala Ala Ser Leu Thr  
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Leu Thr Leu Ala Leu Ile His Leu Val Glu Ala Asn Ser Glu Gly Asp  
20 25 30

Ala Leu Tyr Ala Leu Arg Arg Ser Leu Thr Asp Pro Asp His Val Leu  
35 40 45

Gln Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp Phe His Val  
50 55 60

Thr Cys Asn Gln Asp Asn Arg Val Thr Arg Val Asp Leu Gly Asn Ser  
65 70 75 80

Asn Leu Ser Gly His Leu Ala Pro Glu Leu Gly Lys Leu Glu His Leu  
85 90 95

Gln Tyr Leu Glu Leu Tyr Lys Asn Asn Ile Gln Gly Thr Ile Pro Ser  
100 105 110

Glu Leu Gly Asn Leu Lys Asn Leu Ile Ser Leu Asp Leu Tyr Asn Asn  
115 120 125

Asn Leu Thr Gly Ile Val Pro Thr Phe Leu Gly Lys Leu Lys Ser Leu  
130 135 140

Val Phe Leu Arg Leu Asn Asp Asn Arg Leu Thr Gly Pro Ile Leu Glu  
145 150 155 160

His Ser Arg Gln Ser Gln Ala Phe Lys Val Val Asp Val Ser Ser Asn  
165 170 175

Asp Leu Cys Gly Thr Ile Pro Thr Asn Gly Pro Phe Ala His Ile Pro  
180 185 190

Leu Gln Asn Phe Glu Asn Asn Pro Arg Leu Glu Gly Pro Glu Leu Leu  
195 200 205

Gly Leu Ala Ser Tyr Asp Thr Asn Cys Thr  
210 215

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<211> 981

<212> DNA

<213> unknown

<220>

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<222> (104) .. (757)

<400> 24



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215

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taataagtat atatatgttag taaaaacaaa aaaaatgaag aatcgaatcg gtaatatcat 907  
ctggctcaa ttgagaactt cgaggctgt atgtaaaatt tctaaatgcg attttcgcct 967  
aaattactca cact 981

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<212> PRT  
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1 5 10 15

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20 25 30

Ala Leu Tyr Ala Leu Arg Arg Ser Leu Thr Asp Pro Asp His Val Leu  
35 40 45

Gln Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp Phe His Val  
50 55 60

Thr Cys Asn Gln Asp Asn Arg Val Thr Arg Val Asp Leu Gly Asn Ser  
65 70 75 80

Asn Leu Ser Gly His Leu Ala Pro Glu Leu Gly Lys Leu Glu His Leu  
85 90 95

Gln Tyr Leu Glu Leu Tyr Lys Asn Asn Ile Gln Gly Thr Ile Pro Ser  
100 105 110

Glu Leu Gly Asn Leu Lys Asn Leu Ile Ser Leu Asp Leu Tyr Asn Asn  
115 120 125

Asn Leu Thr Gly Ile Val Pro Thr Ser Leu Gly Lys Leu Lys Ser Leu  
130 135 140

Val Phe Leu Arg Leu Asn Asp Asn Arg Leu Thr Gly Pro Ile Pro Arg  
145 150 155 160

Ala Leu Thr Ala Ile Pro Ser Leu Lys Val Val Asp Val Ser Ser Asn  
165 170 175

Asp Leu Cys Gly Thr Ile Pro Thr Asn Gly Pro Phe Ala His Ile Pro  
180 185 190

Leu Gln Asn Phe Glu Asn Asn Pro Arg Leu Glu Gly Pro Glu Leu Leu

195

200

205

Gly Leu Ala Ser Tyr Asp Thr Asn Cys Thr  
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 Arg Pro Thr Arg Pro Arg Asn Tyr Arg Trp Glu Leu Phe Ala Ala Ser  
 1                5                10                15

tta atc cta acc tta gct ttg att cac ctg gtc gaa gca aac tcc gaa 97  
 Leu Ile Leu Thr Leu Ala Leu Ile His Leu Val Glu Ala Asn Ser Glu  
 20                25                30

gga gat gct ctt tac gct ctt cgc cgg agt tta aca gat ccg gac cat 145  
 Gly Asp Ala Leu Tyr Ala Leu Arg Arg Ser Leu Thr Asp Pro Asp His  
 35                40                45

gtt ctc cag agc tgg gat cca act ctt aat cct tgt acc tgg ttc 193  
 Val Leu Gln Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp Phe  
 50                55                60

cat gtc acc tgt aac caa gac aac cgc gtc act cgt gtg gat ttg ggg 241  
 His Val Thr Cys Asn Gln Asp Asn Arg Val Thr Arg Val Asp Leu Gly  
 65                70                75                80

aat tca aac ctc tct gga cat ctt gc<sup>g</sup> cct gag ctt ggg aag ctt gaa 289  
 Asn Ser Asn Leu Ser Gly His Leu Ala Pro Glu Leu Gly Lys Leu Glu  
 85                90                95

cat tta cag tat cta gag ctc tac aaa aac aac atc caa gga act ata 337  
 His Leu Gln Tyr Leu Glu Leu Tyr Lys Asn Asn Ile Gln Gly Thr Ile  
 100                105                110

cct tcc gaa ctt gga aat ctg aag aat ctc atc agc ttg gat ctg tac 385  
 Pro Ser Glu Leu Gly Asn Leu Lys Asn Leu Ile Ser Leu Asp Leu Tyr  
 115                120                125

aac aac aat ctt aca ggg ata gtt ccc act tct ttg gga aaa ttg aag 433  
 Asn Asn Asn Leu Thr Gly Ile Val Pro Thr Ser Leu Gly Lys Leu Lys  
 130                135                140

tct ctg gtc ttt tta cgg ctt aat gac aac cga ttg acg ggg cca atc 481  
 Ser Leu Val Phe Leu Arg Leu Asn Asp Asn Arg Leu Thr Gly Pro Ile  
 145                150                155                160

cct aga gca ctc act gca atc cca agc ctt aaa gtt gtt gat gtc tca 529  
Pro Arg Ala Leu Thr Ala Ile Pro Ser Leu Lys Val Val Asp Val Ser  
165 170 175

agc aat gat ttg tgt gga aca atc cca aca aac gga cct ttt gct cac 577  
Ser Asn Asp Leu Cys Gly Thr Ile Pro Thr Asn Gly Pro Phe Ala His  
180 185 190

att cct tta cag aac ttt gag aac aac ccg agg ttg gag gga ccg gaa 625  
Ile Pro Leu Gln Asn Phe Glu Asn Asn Pro Arg Leu Glu Gly Pro Glu  
195 200 205

tta ctc ggt ctt gca agc tac gac act aac tgc acc tgaaaaaatt 671  
Leu Leu Gly Leu Ala Ser Tyr Asp Thr Asn Cys Thr  
210 215 220

ggcaaaacct gaaaatgaag aattgggggg tgaccttgta agaacacttc accacttat 731  
caaataatcac atctactatg taataagtat atatatgtag tccaaaaaaaa aaaaaaaaa 789

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<211> 220  
<212> PRT  
<213> unknown

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20 25 30

Gly Asp Ala Leu Tyr Ala Leu Arg Arg Ser Leu Thr Asp Pro Asp His  
35 40 45

Val Leu Gln Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp Phe  
50 55 60

His Val Thr Cys Asn Gln Asp Asn Arg Val Thr Arg Val Asp Leu Gly  
65 70 75 80

Asn Ser Asn Leu Ser Gly His Leu Ala Pro Glu Leu Gly Lys Leu Glu  
85 90 95

His Leu Gln Tyr Leu Glu Leu Tyr Lys Asn Asn Ile Gln Gly Thr Ile  
100 105 110

Pro Ser Glu Leu Gly Asn Leu Lys Asn Leu Ile Ser Leu Asp Leu Tyr  
115 120 125

Asn Asn Asn Leu Thr Gly Ile Val Pro Thr Ser Leu Gly Lys Leu Lys  
130 135 140

Ser Leu Val Phe Leu Arg Leu Asn Asp Asn Arg Leu Thr Gly Pro Ile  
145 150 155 160

Pro Arg Ala Leu Thr Ala Ile Pro Ser Leu Lys Val Val Asp Val Ser  
165 170 175

Ser Asn Asp Leu Cys Gly Thr Ile Pro Thr Asn Gly Pro Phe Ala His  
180 185 190

Ile Pro Leu Gln Asn Phe Glu Asn Asn Pro Arg Leu Glu Gly Pro Glu  
195 200 205

Leu Leu Gly Leu Ala Ser Tyr Asp Thr Asn Cys Thr  
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<211> 894

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<222> (1)..(675)

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1 5 10 15

agc tta tca gat cca gac aat gtt gtt cag agt tgg gat cca act ctt 96  
Ser Leu Ser Asp Pro Asp Asn Val Val Gln Ser Trp Asp Pro Thr Leu  
20 25 30

gtt aat cct tgt act tgg ttt cat gtc act tgt aat caa cac cat caa 144  
Val Asn Pro Cys Thr Trp Phe His Val Thr Cys Asn Gln His His Gln  
35 40 45

gtc act cgt ctg gat ttg ggg aat tca aac tta tct gga cat cta gta 192  
Val Thr Arg Leu Asp Leu Gly Asn Ser Asn Leu Ser Gly His Leu Val  
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cct gaa ctt ggg aag ctt gaa cat tta caa tat ctg tat gga atc atc 240  
Pro Glu Leu Gly Lys Leu Glu His Leu Gln Tyr Leu Tyr Gly Ile Ile  
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act ctt ttg cct ttt gat tat ctg aaa aca ttt aca tta tca gtc aca 288  
Thr Leu Leu Pro Phe Asp Tyr Leu Lys Thr Phe Thr Leu Ser Val Thr  
85 90 95

cat ata aca ttt tgc ttt gag tca tat agt gaa ctc tac aaa aac gag 336  
His Ile Thr Phe Cys Phe Glu Ser Tyr Ser Glu Leu Tyr Lys Asn Glu  
100 105 110

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Ile Gln Gly Thr Ile Pro Ser Glu Leu Gly Asn Leu Lys Ser Leu Ile  
115 120 125

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Leu	Thr	Gly	Pro	Ile	Pro	Arg	Glu	Leu	Thr	Val	Ile	Ser	Ser	Leu	Lys	
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Val	Val	Asp	Val	Ser	Gly	Asn	Asp	Leu	Cys	Gly	Thr	Ile	Pro	Val	Glu	
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gga	cct	ttt	gaa	cac	att	cct	atg	caa	aac	ttt	gag	aac	aac	ctg	aga	
Gly	Pro	Phe	Glu	His	Ile	Pro	Met	Gln	Asn	Phe	Glu	Asn	Asn	Leu	Arg	
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Thr																
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Val	Asn	Pro	Cys	Thr	Trp	Phe	His	Val	Thr	Cys	Asn	Gln	His	His	Gln	
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Val	Thr	Arg	Leu	Asp	Leu	Gly	Asn	Ser	Asn	Leu	Ser	Gly	His	Leu	Val	
													50	55	60	
Pro	Glu	Leu	Gly	Lys	Leu	Glu	His	Leu	Gln	Tyr	Leu	Tyr	Gly	Ile	Ile	
													65	70	75	80
Thr	Leu	Leu	Pro	Phe	Asp	Tyr	Leu	Lys	Thr	Phe	Thr	Leu	Ser	Val	Thr	
													85	90	95	

His Ile Thr Phe Cys Phe Glu Ser Tyr Ser Glu Leu Tyr Lys Asn Glu  
100 105 110

Ile Gln Gly Thr Ile Pro Ser Glu Leu Gly Asn Leu Lys Ser Leu Ile  
115 120 125

Ser Leu Asp Leu Tyr Asn Asn Leu Thr Gly Lys Ile Pro Ser Ser  
130 135 140

Leu Gly Lys Leu Lys Ser Leu Val Phe Leu Arg Leu Asn Glu Asn Arg  
145 150 155 160

Leu Thr Gly Pro Ile Pro Arg Glu Leu Thr Val Ile Ser Ser Leu Lys  
165 170 175

Val Val Asp Val Ser Gly Asn Asp Leu Cys Gly Thr Ile Pro Val Glu  
180 185 190

Gly Pro Phe Glu His Ile Pro Met Gln Asn Phe Glu Asn Asn Leu Arg  
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Met Ala Ser Arg  
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aac tat cgg tgg gag ctc ttc gca gct tcg tta atc cta acc tta gct 165  
Asn Tyr Arg Trp Glu Leu Phe Ala Ala Ser Leu Ile Leu Thr Leu Ala  
5 10 15 20

ttg att cac ctg gtc gaa gca aac tcc gaa gga gat gct ctt tac gct 213  
Leu Ile His Leu Val Glu Ala Asn Ser Glu Gly Asp Ala Leu Tyr Ala  
25 30 35

ctt cgc cggtt aca gat ccg gac cat gtt ctc cag agc tgg gat 261  
Leu Arg Arg Ser Leu Thr Asp Pro Asp His Val Leu Gln Ser Trp Asp  
40 45 50

cca act ctt gtt aat cct tgt acc tgg ttc cat gtc acc tgt aac caa	309
Pro Thr Leu Val Asn Pro Cys Thr Trp Phe His Val Thr Cys Asn Gln	
55 60 65	
gac aac cgc gtc act cgt gtg gat ttg ggg aat tca aac ctc tct gga	357
Asp Asn Arg Val Thr Arg Val Asp Leu Gly Asn Ser Asn Leu Ser Gly	
70 75 80	
cat ctt gcg cct gag ctt ggg aag ctt gaa cat tta cag tat cta gag	405
His Leu Ala Pro Glu Leu Gly Lys Leu Glu His Leu Gln Tyr Leu Glu	
85 90 95 100	
ctc tac aaa aac aac atc caa gga act ata cct tcc gaa ctt gga aat	453
Leu Tyr Lys Asn Asn Ile Gln Gly Thr Ile Pro Ser Glu Leu Gly Asn	
105 110 115	
ctg aag aat ctc atc agc ttg gat ctg tac aac aac aat ctt aca ggg	501
Leu Lys Asn Leu Ile Ser Leu Asp Leu Tyr Asn Asn Asn Leu Thr Gly	
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ata gtt ccc act tct ttg gga aaa ttg aag tct ctg gtc ttt tta cgg	549
Ile Val Pro Thr Ser Leu Gly Lys Leu Lys Ser Leu Val Phe Leu Arg	
135 140 145	
ctt aat gac aac cga ttg acg ggg cca atc cct aga gca ctc act gca	597
Leu Asn Asp Asn Arg Leu Thr Gly Pro Ile Pro Arg Ala Leu Thr Ala	
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atc cca agc ctt aaa gtt gtt gat gtc tca agc aat gat ttg tgt gga	645
Ile Pro Ser Leu Lys Val Val Asp Val Ser Ser Asn Asp Leu Cys Gly	
165 170 175 180	
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Thr Ile Pro Thr Asn Gly Pro Phe Ala His Ile Pro Leu Gln Asn Phe	
185 190 195	
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Glu Asn Asn Pro Arg Leu Glu Gly Pro Glu Leu Leu Gly Leu Ala Ser	
200 205 210	
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Tyr Asp Thr Asn Cys Thr	
215	
aattgggggg tgaccttgta agaacacttc accactttat caaatatcac atctactatg	849
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ggtctcaatt gagaactttg aggtctgtgt atgtaaaatt tctaaatgcg actttcgct	969
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Ala Leu Tyr Ala Leu Arg Arg Ser Leu Thr Asp Pro Asp His Val Leu  
35 40 45  
  
Gln Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp Phe His Val  
50 55 60  
  
Thr Cys Asn Gln Asp Asn Arg Val Thr Arg Val Asp Leu Gly Asn Ser  
65 70 75 80  
  
Asn Leu Ser Gly His Leu Ala Pro Glu Leu Gly Lys Leu Glu His Leu  
85 90 95  
  
Gln Tyr Leu Glu Leu Tyr Lys Asn Asn Ile Gln Gly Thr Ile Pro Ser  
100 105 110  
  
Glu Leu Gly Asn Leu Lys Asn Leu Ile Ser Leu Asp Leu Tyr Asn Asn  
115 120 125  
  
Asn Leu Thr Gly Ile Val Pro Thr Ser Leu Gly Lys Leu Lys Ser Leu  
130 135 140  
  
Val Phe Leu Arg Leu Asn Asp Asn Arg Leu Thr Gly Pro Ile Pro Arg  
145 150 155 160  
  
Ala Leu Thr Ala Ile Pro Ser Leu Lys Val Val Asp Val Ser Ser Asn  
165 170 175  
  
Asp Leu Cys Gly Thr Ile Pro Thr Asn Gly Pro Phe Ala His Ile Pro  
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atTTTcgaa gttagggttt tctcgatct gaagagatca aatcaagatt cgAAATTTac 180  
cattgttgtt tgaa atg gag tcg agt tat gtg gtg ttt atc tta ctt tca 230  
Met Glu Ser Ser Tyr Val Val Phe Ile Leu Leu Ser  
1 5 10  
ctg atc tta ctt ccg aat cat tca ctg tgg ctt gct tct gct aat ttg 278  
Leu Ile Leu Leu Pro Asn His Ser Leu Trp Leu Ala Ser Ala Asn Leu  
15 20 25  
gaa ggt gat gct ttg cat act ttg agg gtt act cta gtt gat cca aac 326  
Glu Gly Asp Ala Leu His Thr Leu Arg Val Thr Leu Val Asp Pro Asn  
30 35 40  
aat gtc ttg cag agc tgg gat cct acg cta gtg aat cct tgc aca tgg 374  
Asn Val Leu Gln Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp  
45 50 55 60  
ttc cat gtc act tgc aac aac gag aac agt gtc ata aga gtt gat ttg 422  
Phe His Val Thr Cys Asn Asn Glu Asn Ser Val Ile Arg Val Asp Leu  
65 70 75  
ggg aat gca gag tta tct ggc cat tta gtt cca gag ctt ggt gtg ctc 470  
Gly Asn Ala Glu Leu Ser Gly His Leu Val Pro Glu Leu Gly Val Leu  
80 85 90  
aag aat ttg cag tat ttg gag ctt tac agt aac aac ata act ggc ccg 518  
Lys Asn Leu Gln Tyr Leu Glu Leu Tyr Ser Asn Asn Ile Thr Gly Pro  
95 100 105  
att cct agt aat ctt gga aat ctg aca aac tta gtg agt ttg gat ctt 566  
Ile Pro Ser Asn Leu Gly Asn Leu Thr Asn Leu Val Ser Leu Asp Leu  
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tac tta aac agc ttc tcc ggt cct att ccg gaa tca ttg gga aag ctt 614  
Tyr Leu Asn Ser Phe Ser Gly Pro Ile Pro Glu Ser Leu Gly Lys Leu  
125 130 135 140  
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Ser Lys Leu Arg Phe Leu Arg Leu Asn Asn Ser Leu Thr Gly Ser  
145 150 155  
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160 165 170  
tca aat aac aga ctc tct ggt tca gtt cct gac aat ggc tcc ttc tca 758  
Ser Asn Asn Arg Leu Ser Gly Ser Val Pro Asp Asn Gly Ser Phe Ser  
175 180 185  
ctc ttc aca ccc atc agt ttt gct aat aac tta gac cta tgt gga cct 806

Leu Phe Thr Pro Ile Ser Phe Ala Asn Asn Leu Asp Leu Cys Gly Pro			
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Val Thr Ser His Pro Cys Pro Gly Ser Pro Pro Phe Ser Pro Pro Pro			
205	210	215	220
cct ttt att caa cct ccc cca gtt tcc acc ccg agt ggg tat ggt ata			902
Pro Phe Ile Gln Pro Pro Pro Val Ser Thr Pro Ser Gly Tyr Gly Ile			
225	230	235	
act gga gca ata gct ggt gga gtt gct gca ggt gct gct ttg ccc ttt			950
Thr Gly Ala Ile Ala Gly Gly Val Ala Ala Gly Ala Ala Leu Pro Phe			
240	245	250	
gct gct cct gca ata gcc ttt gct tgg tgg cga cga aga agc cca cta			998
Ala Ala Pro Ala Ile Ala Phe Ala Trp Trp Arg Arg Arg Ser Pro Leu			
255	260	265	
gat att ttc ttc gat gtc cct gcc gaa gaa gat cca gaa gtt cat ctg			1046
Asp Ile Phe Phe Asp Val Pro Ala Glu Glu Asp Pro Glu Val His Leu			
270	275	280	
gga cag ctc aag agg ttt tct ttg cgg gag cta caa gtg gcg agt gat			1094
Gly Gln Leu Lys Arg Phe Ser Leu Arg Glu Leu Gln Val Ala Ser Asp			
285	290	295	300
ggg ttt agt aac aag aac att ttg ggc aga ggt ggg ttt ggg aaa gtc			1142
Gly Phe Ser Asn Lys Asn Ile Leu Gly Arg Gly Gly Phe Gly Lys Val			
305	310	315	
tac aag gga cgc ttg gca gac gga act ctt gtt gct gtc aag aga ctg			1190
Tyr Lys Gly Arg Leu Ala Asp Gly Thr Leu Val Ala Val Lys Arg Leu			
320	325	330	
aag gaa gag cga act cca ggt gga gag ctc cag ttt caa aca gaa gta			1238
Lys Glu Glu Arg Thr Pro Gly Gly Glu Leu Gln Phe Gln Thr Glu Val			
335	340	345	
gag atg ata agt atg gca gtt cat cga aac ctg ttg aga tta cga ggt			1286
Glu Met Ile Ser Met Ala Val His Arg Asn Leu Leu Arg Leu Arg Gly			
350	355	360	
ttc tgt atg aca ccg acc gag aga ttg ctt gtg tat cct tac atg gcc			1334
Phe Cys Met Thr Pro Thr Glu Arg Leu Leu Val Tyr Pro Tyr Met Ala			
365	370	375	380
aat gga agt gtt tgc tgt ctc aga gag agg cca ccg tca caa cct			1382
Asn Gly Ser Val Ala Ser Cys Leu Arg Glu Arg Pro Pro Ser Gln Pro			
385	390	395	
ccg ctt gat tgg cca acg ccg aag aga atc gcg cta ggc tca gct cga			1430
Pro Leu Asp Trp Pro Thr Arg Lys Arg Ile Ala Leu Gly Ser Ala Arg			
400	405	410	
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Gly Leu Ser Tyr Leu His Asp His Cys Asp Pro Lys Ile Ile His Arg			

415	420	425	
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430	435	440	
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445	450	455	460
gtg aca aca gca gtc cgt ggc acc atc ggt cac atc gct cca gaa tat Val Thr Thr Ala Val Arg Gly Thr Ile Gly His Ile Ala Pro Glu Tyr			1622
465	470	475	
ctc tca acc gga aaa tct tca gag aaa acc gac gtt ttc gga tac gga Leu Ser Thr Gly Lys Ser Ser Glu Lys Thr Asp Val Phe Gly Tyr Gly			1670
480	485	490	
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495	500	505	
cg <sup>g</sup> cta gct aac gac gac gtc atg tta ctt gac tgg gtg aaa gga Arg Leu Ala Asn Asp Asp Val Met Leu Leu Asp Trp Val Lys Gly			1766
510	515	520	
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525	530	535	540
aca aac tac gag gag aga gaa ctg gaa caa gtg ata caa gtg gcg ttg Thr Asn Tyr Glu Arg Glu Leu Glu Gln Val Ile Gln Val Ala Leu			1862
545	550	555	
cta tgc acg caa gga tca cca atg gaa aga cca aag atg tct gaa gtt Leu Cys Thr Gln Gly Ser Pro Met Glu Arg Pro Lys Met Ser Glu Val			1910
560	565	570	
gta agg atg ctg gaa gga gat ggg ctt gcg gag aaa tgg gac gaa tgg Val Arg Met Leu Glu Gly Asp Gly Leu Ala Glu Lys Trp Asp Glu Trp			1958
575	580	585	
caa aaa gtt gag att ttg agg gaa gag att gat ttg agt cct aat cct Gln Lys Val Glu Ile Leu Arg Glu Glu Ile Asp Leu Ser Pro Asn Pro			2006
590	595	600	
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35 40 45  
Ser Trp Asp Pro Thr Leu Val Asn Pro Cys Thr Trp Phe His Val Thr  
50 55 60  
Cys Asn Asn Glu Asn Ser Val Ile Arg Val Asp Leu Gly Asn Ala Glu  
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Leu Ser Gly His Leu Val Pro Glu Leu Gly Val Leu Lys Asn Leu Gln  
85 90 95  
Tyr Leu Glu Leu Tyr Ser Asn Asn Ile Thr Gly Pro Ile Pro Ser Asn  
100 105 110  
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115 120 125  
Phe Ser Gly Pro Ile Pro Glu Ser Leu Gly Lys Leu Ser Lys Leu Arg  
130 135 140  
Phe Leu Arg Leu Asn Asn Asn Ser Leu Thr Gly Ser Ile Pro Met Ser  
145 150 155 160  
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165 170 175  
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180 185 190  
Ile Ser Phe Ala Asn Asn Leu Asp Leu Cys Gly Pro Val Thr Ser His  
195 200 205  
Pro Cys Pro Gly Ser Pro Pro Phe Ser Pro Pro Pro Pro Phe Ile Gln  
210 215 220  
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225 230 235 240  
Ala Gly Gly Val Ala Ala Gly Ala Ala Leu Pro Phe Ala Ala Pro Ala  
245 250 255  
Ile Ala Phe Ala Trp Trp Arg Arg Arg Ser Pro Leu Asp Ile Phe Phe  
260 265 270  
Asp Val Pro Ala Glu Glu Asp Pro Glu Val His Leu Gly Gln Leu Lys  
275 280 285

Arg Phe Ser Leu Arg Glu Leu Gln Val Ala Ser Asp Gly Phe Ser Asn  
290 295 300

Lys Asn Ile Leu Gly Arg Gly Gly Phe Gly Lys Val Tyr Lys Gly Arg  
305 310 315 320

Leu Ala Asp Gly Thr Leu Val Ala Val Lys Arg Leu Lys Glu Glu Arg  
325 330 335

Thr Pro Gly Gly Glu Leu Gln Phe Gln Thr Glu Val Glu Met Ile Ser  
340 345 350

Met Ala Val His Arg Asn Leu Leu Arg Leu Arg Gly Phe Cys Met Thr  
355 360 365

Pro Thr Glu Arg Leu Leu Val Tyr Pro Tyr Met Ala Asn Gly Ser Val  
370 375 380

Ala Ser Cys Leu Arg Glu Arg Pro Pro Ser Gln Pro Pro Leu Asp Trp  
385 390 395 400

Pro Thr Arg Lys Arg Ile Ala Leu Gly Ser Ala Arg Gly Leu Ser Tyr  
405 410 415

Leu His Asp His Cys Asp Pro Lys Ile Ile His Arg Asp Val Lys Ala  
420 425 430

Ala Asn Ile Leu Leu Asp Glu Glu Phe Glu Ala Val Val Gly Asp Phe  
435 440 445

Gly Leu Ala Lys Leu Met Asp Tyr Lys Asp Thr His Val Thr Thr Ala  
450 455 460

Val Arg Gly Thr Ile Gly His Ile Ala Pro Glu Tyr Leu Ser Thr Gly  
465 470 475 480

Lys Ser Ser Glu Lys Thr Asp Val Phe Gly Tyr Gly Ile Met Leu Leu  
485 490 495

Glu Leu Ile Thr Gly Gln Arg Ala Phe Asp Leu Ala Arg Leu Ala Asn  
500 505 510

Asp Asp Asp Val Met Leu Leu Asp Trp Val Lys Gly Leu Leu Lys Glu  
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530 535 540 545

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Gly Ser Pro Met Glu Arg Pro Lys Met Ser Glu Val Val Arg Met Leu  
565 570 575

Glu Gly Asp Gly Leu Ala Glu Lys Trp Asp Glu Trp Gln Lys Val Glu  
580 585 590

Ile Leu Arg Glu Glu Ile Asp Leu Ser Pro Asn Pro Asn Ser Asp Trp  
595 600 605

Ile Leu Asp Ser Thr Tyr Asn Leu His Ala Val Glu Leu Ser Gly Pro  
610 615 620

Arg  
625